AMENDMENTS

In the claims

Claim 1 (currently amended): A riser reactor configured for a fluidized catalytic conversion process including hydrocarbon cracking reactions on hydrocarbons ~~flowing substantially from a reactor bottom to a reactor top to produce converted hydrocarbons, the reactor having a substantially vertical linear axis, a riser reactor heighth, the reactor bottom, and the reactor top, and~~ wherein the riser reactor comprises a reactor bottom and further comprises in order from the reactor bottom:

a.) a prelift zone having a prelift zone diameter and a prelift zone height and containing catalytic cracking catalyst,

b.) a first reaction zone having a first reaction zone diameter and a first reaction zone height~~h~~ ~~and wherein the first reaction zone is configured so that a hydrocarbon cracking reaction taking place in the first reaction zone takes place at higher reaction temperatures, higher ratios of catalyst to oil, and shorter reaction times than, respectively, a reaction temperature, ratio of catalyst to oil, and reaction time in a second reactor zone~~ and containing catalytic cracking catalyst,

c.) [[the]]a second reaction zone having a second reaction zone height[[h]] and a second reaction zone diameter that is larger than the first reaction zone diameter ~~and wherein said second reaction zone is configured so that a hydrocarbon cracking reaction taking place in the second reaction zone takes place at lower reaction temperature, lower ratio of catalyst to oil, and longer reaction time than, respectively, the reaction temperature, ratio of catalyst to oil, and reaction time in the first reactor zone~~ and containing catalytic cracking catalyst,

d.) an optional outlet zone having an outlet zone diameter that is reduced with respect to the second reaction zone diameter.

Claim 2 (previously presented): The reactor of claim 1 wherein the total height of said prelift zone, said first reaction zone, said second reaction zone, and said outlet zone is in the range of from about 10 meters to about 60 meters.

Claim 3 (previously presented): The reactor of claim 1 wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor.

Claim 4 (previously presented): The reactor of claim 1 wherein the ratio of the first reaction zone diameter to said prelift zone diameter is from about 1:1 to about 2:1 and the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor.

Claim 5 (previously presented): The reactor of claim 1 wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor.

Claim 6 (currently amended): The reactor of claim 1 wherein the ratio of said outlet zone diameter to said first reaction zone diameter is in the range of from about 0.8:1 to about 1.5:1 and the height of said outlet zone is ~~generally~~ from about 0% to about 20% of the height of the riser reactor.

Claim 7 (previously presented): The reactor of claim 1 further comprising a first junction section between said first reaction zone and said second reaction zone, and wherein said first junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 30°~80°.

Claim 8 (previously presented): The reactor of claim 1 further comprising a second junction section between said second reaction zone and said outlet zone, and wherein said second junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 45°~85°.

Claim 9 (new): A riser reactor configured for a fluidized catalytic conversion process including hydrocarbon conversion reactions on hydrocarbons flowing substantially from a reactor bottom to produce converted hydrocarbons, the reactor having a substantially vertical linear axis, a riser reactor height, and the reactor bottom, and wherein the riser reactor comprises in order from the reactor bottom:

a.) a prelift zone having a prelift zone diameter and a prelift zone height,

b.) a first reaction zone having a first reaction zone diameter and a first reaction zone height and wherein the first reaction zone is configured so that a hydrocarbon cracking reaction taking place in the first reaction zone takes place at higher reaction temperatures, higher ratios of catalyst to oil, and shorter reaction times than, respectively, a reaction temperature, ratio of catalyst to oil, and reaction time in a second reaction zone,

c.) the second reaction zone having a second reaction zone heighth and a second reaction zone diameter that is larger than the first reaction zone diameter and wherein said second reaction zone is configured so that a hydrocarbon conversion reaction taking place in the second reaction zone takes place at lower reaction temperature, lower ratio of catalyst to oil, and longer reaction time than, respectively, the reaction temperature, ratio of catalyst to oil, and reaction time in the first reaction zone, and

d.) an outlet zone having an outlet zone diameter that is reduced with respect to the second reaction zone diameter.

Claim 10 (new): The reactor of claim 9 wherein the total height of said prelift zone, said first reaction zone, said second reaction zone, and said outlet zone is in the range of from about 10 meters to about 60 meters.

Claim 11 (new): The reactor of claim 9 wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor.

Claim 12 (new): The reactor of claim 9 wherein the ratio of the first reaction zone diameter to said prelift zone diameter is from about 1:1 to about 2:1 and the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor.

Claim 13 (new): The reactor of claim 9 wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor.

Claim 14 (new): The reactor of claim 9 wherein the ratio of said outlet zone diameter to said first reaction zone diameter is in the range of from about 0.8:1 to about 1.5:1 and the height of said outlet zone is generally from about 0% to about 20% of the height of the riser reactor.

Claim 15 (new): The reactor of claim 9 further comprising a first junction section between said first reaction zone and said second reaction zone, and wherein said first junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 30°~80°.

Claim 16 (new): The reactor of claim 9 further comprising a second junction section between said second reaction zone and said outlet zone, and wherein said second junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 45°~85°.

Claim 17 (new): A riser reactor configured for a fluidized catalytic conversion process to produce converted hydrocarbons, the reactor having a substantially vertical linear axis, a riser reactor height, and a reactor bottom, and wherein the riser reactor comprises in order from the reactor bottom:

a.) a prelift zone having a prelift zone diameter and a prelift zone height,

b.) a first reaction zone having a first reaction zone diameter and a first reaction zone height and wherein the first reaction zone is configured so that a hydrocarbon cracking reaction taking place,

c.) the second reaction zone having a second reaction zone heighth and a second reaction zone diameter and wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1, said second reaction zone is configured so that a hydrocarbon conversion reaction taking place , and

d.) an optional outlet zone having an outlet zone diameter that is reduced with respect to the second reaction zone diameter.

Claim 18 (new): The reactor of claim 17 wherein the total height of said prelift zone, said first reaction zone, said second reaction zone, and said outlet zone is in the range of from about 10 meters to about 60 meters.

Claim 19 (new): The reactor of claim 17 wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor.

Claim 20 (new): The reactor of claim 17 wherein the ratio of the first reaction zone diameter to said prelift zone diameter is from about 1:1 to about 2:1 and the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor.

Claim 21 (new): The reactor of claim 17 wherein the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor.

Claim 22 (new): The reactor of claim 17 wherein the ratio of said outlet zone diameter to said first reaction zone diameter is in the range of from about 0.8:1 to about 1.5:1 and the height of said outlet zone is from about 0% to about 20% of the height of the riser reactor.

Claim 23 (new): The reactor of claim 17 further comprising a first junction section between said first reaction zone and said second reaction zone, and wherein said first junction section has a

circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 30°~80°.

Claim 24 (new): The reactor of claim 17 further comprising a second junction section between said second reaction zone and said outlet zone, and wherein said second junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 45°~85°.

Claim 25 (new): A fluidized catalytic conversion process including hydrocarbon cracking reactions on hydrocarbons in the riser reactor of claim 1 comprising:

a.) providing the riser reactor of claim 1,

b.) passing catalytic cracking catalyst into a prelift zone having a prelift zone diameter and a prelift zone height and containing catalytic cracking catalyst,

c.) passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone having a first reaction zone diameter and a first reaction zone height to produce a first reaction zone product containing catalytic cracking catalyst, catalytic cracking hydrocarbon feed, and cracked hydrocarbon product,

d.) passing the first reaction zone product from the first reaction zone to a second reaction zone having a second reaction zone height and a second reaction zone diameter that is larger than the first reaction zone diameter to produce a second reaction zone product containing catalytic cracking catalyst, catalytic cracking hydrocarbon feed, and cracked hydrocarbon product, and

e.) passing the second reaction zone product from the second reaction zone to an optional outlet zone having an outlet zone diameter that is reduced with respect to the second reaction zone diameter.

Claim 26. (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system wherein the total height of said prelift zone, said

first reaction zone, said second reaction zone, and said outlet zone is in the range of from about 10 meters to about 60 meters.

Claim 27 (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor, and wherein the step of passing catalytic cracking catalyst into said prelift zone comprises passing catalytic cracking catalyst into a prelift zone wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor.

Claim 28 (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system wherein the ratio of the first reaction zone diameter to said prelift zone diameter is from about 1:1 to about 2:1 and the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor and wherein the step of passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone comprises passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone having a first reaction zone diameter to said prelift zone diameter from about 1:1 to about 2:1 and wherein the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor..

Claim 29 (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor and wherein the step of passing the first reaction zone stream from the first reaction zone to the second reaction zone and wherein the step of wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1

and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor..

Claim 30 (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system wherein the ratio of said outlet zone diameter to said first reaction zone diameter is in the range of from about 0.8:1 to about 1.5:1 and the height of said outlet zone is from about 0% to about 20% of the height of the riser reactor..

Claim 31 (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system further comprising a first junction section between said first reaction zone and said second reaction zone, and wherein said first junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 30°~80°.

Claim 32. (new): The process of claim 25 wherein the step of providing the reactor system of claim 1 comprises providing a reactor system further comprising a second junction section between said second reaction zone and said outlet zone, and wherein said second junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 45°~85°.

Claim 33 (new): A fluidized catalytic conversion process including hydrocarbon cracking reactions on hydrocarbons flowing substantially from a reactor bottom to produce converted hydrocarbons, in the riser reactor of claim 9, the reactor having a substantially vertical linear axis, a riser reactor height, and the reactor bottom, the process comprising the steps of:

a.) providing the riser reactor of claim 9,

b.) passing catalytic cracking catalyst into a prelift zone having a prelift zone diameter and a prelift zone height and containing catalytic cracking catalyst,

c.) passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone having a first reaction zone diameter and a first reaction zone

height for a hydrocarbon cracking reaction in the first reaction zone at higher reaction temperatures, higher ratios of catalyst to oil, and shorter reaction times than, respectively, a reaction temperature, ratio of catalyst to oil, and reaction time in a second reaction zone, to produce a first reaction zone stream containing catalytic cracking catalyst, catalytic cracking hydrocarbon feed, and cracked hydrocarbon product,

d.) passing the first reaction zone stream from the first reaction zone to the second reaction zone having a second reaction zone height and a second reaction zone diameter that is larger than the first reaction zone diameter for a hydrocarbon cracking reaction in the second reaction zone at lower reaction temperatures, lower ratios of catalyst to oil, and longer reaction times than, respectively, the reaction temperature, ratio of catalyst to oil, and reaction time in the first reaction zone to produce a second reaction zone stream containing catalytic cracking catalyst and cracked hydrocarbon product, and, and

e.) passing the second reaction zone stream from the second reaction zone to an outlet zone having an outlet zone diameter that is reduced with respect to the second reaction zone diameter.

Claim 34 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system wherein the total height of said prelift zone, said first reaction zone, said second reaction zone, and said outlet zone is in the range of from about 10 meters to about 60 meters.

Claim 35 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor, and wherein the step of passing catalytic cracking catalyst into said prelift zone comprises passing catalytic cracking catalyst into a prelift zone wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor.

Claim 36 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system wherein the ratio of the first reaction zone diameter to said prelift zone diameter is from about 1:1 to about 2:1 and the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor and wherein the step of passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone comprises passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone having a first reaction zone diameter to said prelift zone diameter from about 1:1 to about 2:1 and wherein the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor.

Claim 37 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor and wherein the step of passing the first reaction zone stream from the first reaction zone to the second reaction zone and wherein the step of wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor.

Claim 38 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system wherein the ratio of said outlet zone diameter to said first reaction zone diameter is in the range of from about 0.8:1 to about 1.5:1 and the height of said outlet zone is from about 0% to about 20% of the height of the riser reactor.

Claim 39 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system further comprising a first junction section between said first reaction zone and said second reaction zone, and wherein said first junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 30°~80°.

Claim 40 (new): The process of claim 33 wherein the step of providing the reactor system of claim 9 comprises providing a reactor system further comprising a second junction section between said second reaction zone and said outlet zone, and wherein said second junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 45°~85°.

Claim 41 (new): A fluidized catalytic conversion process including hydrocarbon cracking reactions on hydrocarbons flowing substantially from a reactor bottom to produce converted hydrocarbons, in the riser reactor of claim 17, the riser reactor having a substantially vertical linear axis, a riser reactor height, and the reactor bottom, comprising the steps of:

a.) providing the riser reactor of claim 17,

b.) passing catalytic cracking catalyst into a prelift zone having a prelift zone diameter and a prelift zone height and containing catalytic cracking catalyst,

c.) passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone having a first reaction zone diameter and a first reaction zone height and wherein the first reaction zone is configured so that a hydrocarbon cracking reaction takes place to produce a first reaction zone stream containing catalytic cracking hydrocarbon feed, catalytic cracking catalyst, and cracked hydrocarbon product,

d.) passing the first reaction zone stream to a second reaction zone having a second reaction zone height and a second reaction zone diameter and wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1, said second reaction zone is configured so that a hydrocarbon conversion reaction takes place to produce a second reaction zone stream containing catalytic cracking catalyst, catalytic cracking hydrocarbon feed, and cracked hydrocarbon product, and,

e.) passing the second reaction zone stream from the second reaction zone to an optional outlet zone having an outlet zone diameter that is reduced with respect to the second reaction zone diameter to separate converted hydrocarbons.

Claim 42 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system wherein the total height of said prelift zone, said first reaction zone, said second reaction zone, and said outlet zone is in the range of from about 10 meters to about 60 meters.

Claim 43 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor, and wherein the step of passing catalytic cracking catalyst into said prelift zone comprises passing catalytic cracking catalyst into a prelift zone wherein the diameter of said prelift zone is in the range of from about 0.02 meters and about 5 meters and the prelift zone height is in the range of from about 5% to about 10% of the height of the riser reactor.

Claim 44 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system wherein the ratio of the first reaction zone diameter to said prelift zone diameter is from about 1:1 to about 2:1 and the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor and wherein the step of passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone comprises passing catalytic cracking hydrocarbon feed and catalytic cracking catalyst from the prelift zone to a first reaction zone having a first reaction zone diameter to said prelift zone diameter from about 1:1 to about 2:1 and wherein the height of said first reaction zone is from about 10% to about 30% of the height of the riser reactor.

Claim 45 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor and wherein the step of passing the first reaction zone stream from the first reaction zone to the second reaction zone and wherein the step of wherein the ratio of said second reaction zone diameter to said first reaction zone diameter is in the range of from about 1.5:1 to about 5:1 and the height of said second reaction zone is in the range of from about 30% to about 60% of the height of the riser reactor.

Claim 46 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system wherein the ratio of said outlet zone diameter to said first reaction zone diameter is in the range of from about 0.8:1 to about 1.5:1 and the height of said outlet zone is from about 0% to about 20% of the height of the riser reactor.

Claim 47 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system further comprising a first junction section between said first reaction zone and said second reaction zone, and wherein said first junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 30°~80°.

Claim 48 (new): The process of claim 41 wherein the step of providing the reactor system of claim 17 comprises providing a reactor system further comprising a second junction section between said second reaction zone and said outlet zone, and wherein said second junction section has a circular truncated cone shape with a vertical section vertex angle with respect to the reactor axis in the range of about 45°~85°.